


Institute for Advanced Sustainability Studies IASS in Potsdam

How to scale up renewable energy across the continent

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Short background information on the IASS work on renewable energy in Africa

- At the G7 summit in Elmau 2015, the G7 declared to support the goal of the Africa Renewable Energy (RE) Initiative to reach up to 10 GW of additional installed RE capacities by 2020 in Africa

- In the aftermath of the summit, the German Ministry for Economic Cooperation and Development commissioned the IASS to conduct a study on
  - Status quo of RE in Africa
  - Potentials for growth and development
  - Ongoing donor initiatives in Africa's RE sector
  - Options for further engagement

- Then, our team conducted a mapping of major donor initiatives in the African energy sector for the Africa-EU Energy Partnership (AEEP)

Outline of my presentation today

1) Status quo and potential of renewable energy deployment in Africa

2) International cooperation to promote renewables in Africa

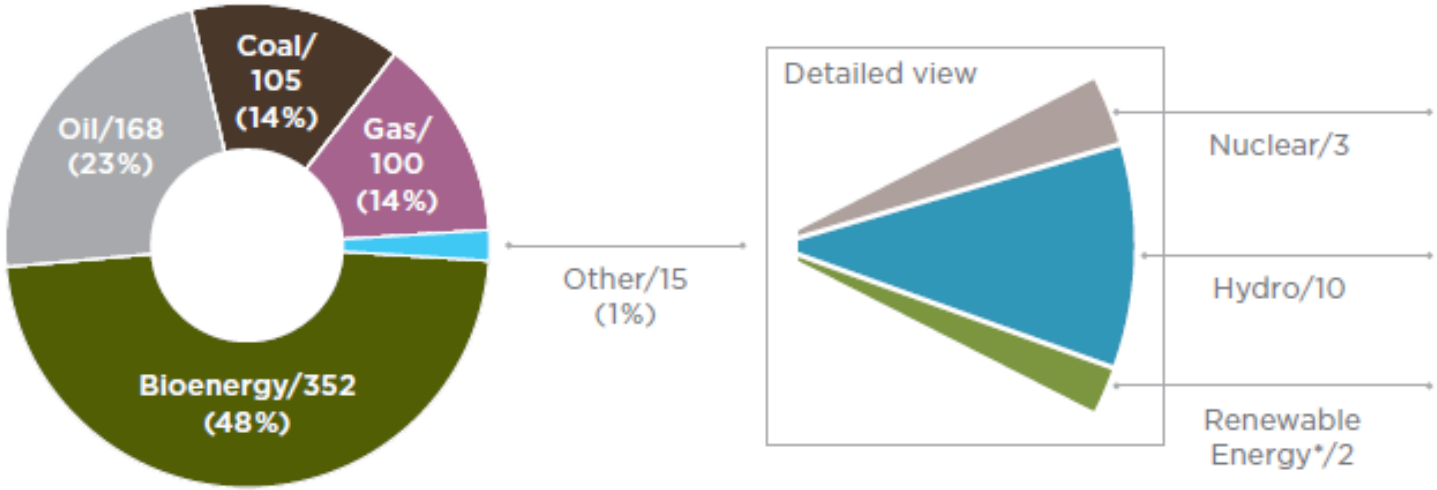
3) Financing renewables: the challenge of derisking

1) Status quo and potential of renewable energy deployment in Africa

Modern RE sources still play a minor role in the African energy mix (I).

FIGURE 1: THE AFRICAN ENERGY MIX

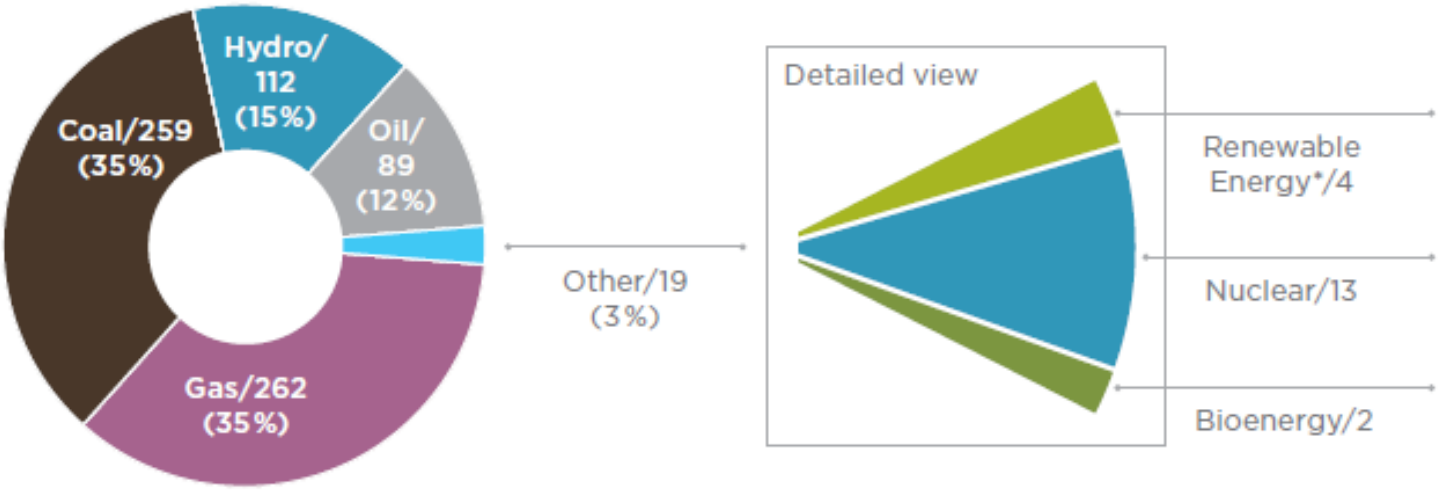
a) Status in 2012 (Mtoe)



Modern RE sources still play a minor role in the African energy mix (II).

FIGURE 2: THE AFRICAN ELECTRICITY MIX

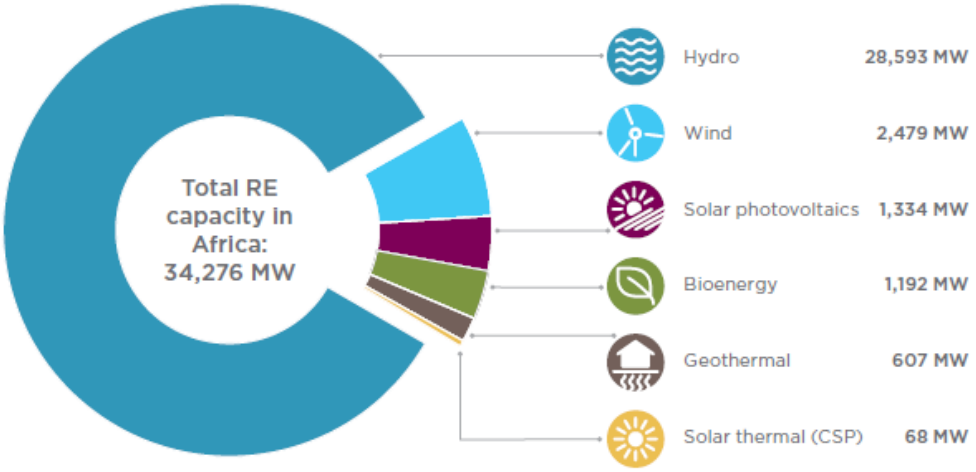
a) Status in 2012 (TWh)



However, RE deployment is expanding rapidly.

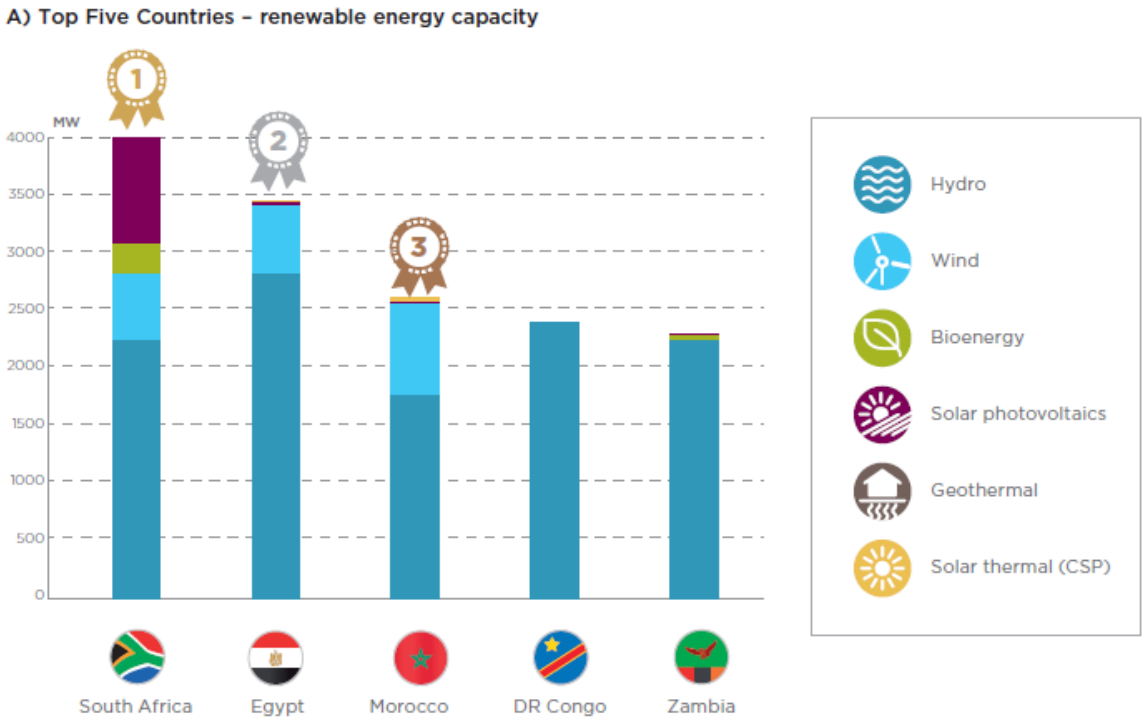
- Since 2000, installed renewable energy capacities increased by almost 50%, amounting to more the 34 GW in 2014.

FIGURE 4: RENEWABLE ENERGY CAPACITY IN AFRICA (2014)

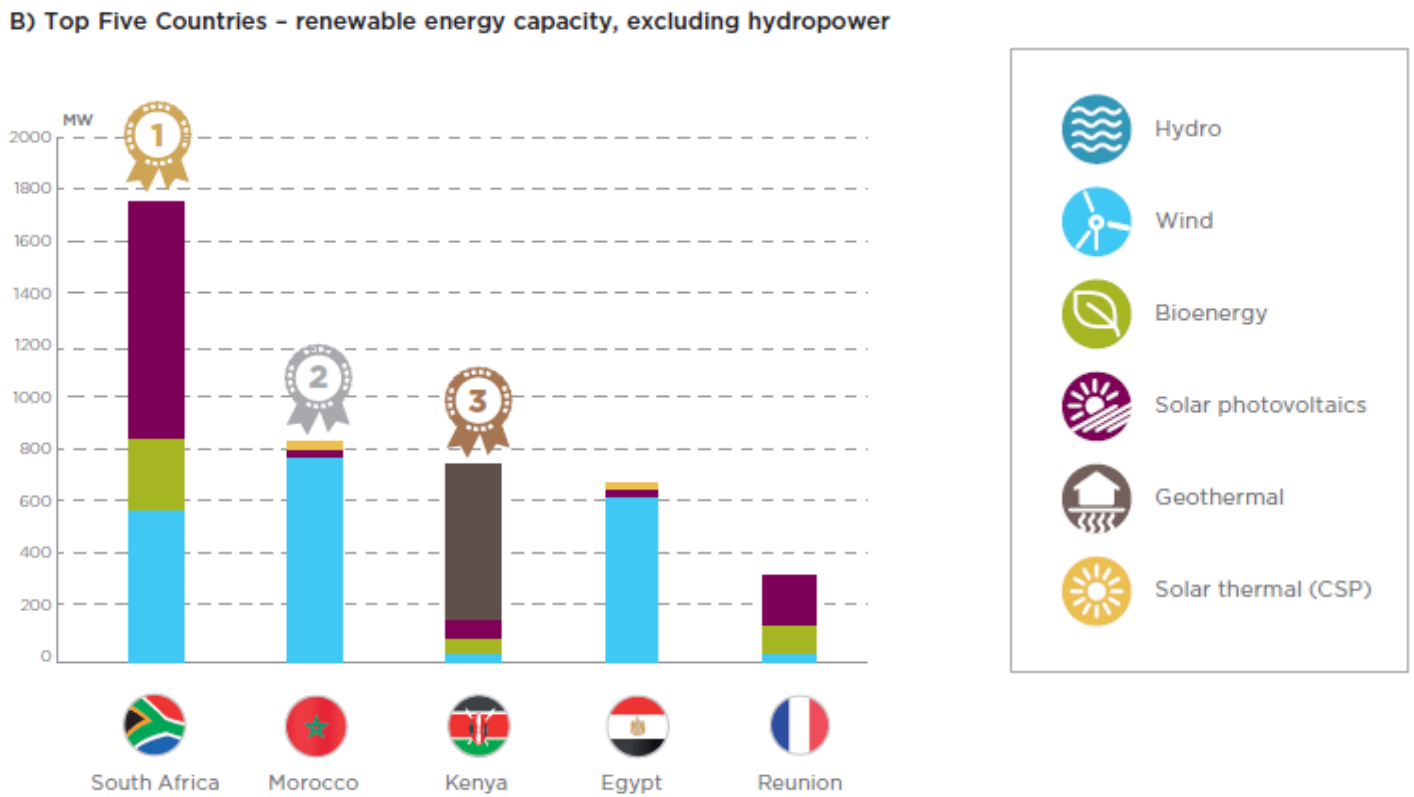


Source: Based on IRENA Renewable Energy Capacity Statistics 2015.

Egypt is one of the African RE frontrunners (I).



Egypt is one of the African RE frontrunners (II).



Major RE capacity additions by 2020 are expected in wind energy, hydropower and solar PV.

Table 1: Technology specific targets for additional renewable energy capacity of selected African countries for the year 2020 (additional planned capacity compared to existing capacity in 2014, MW)

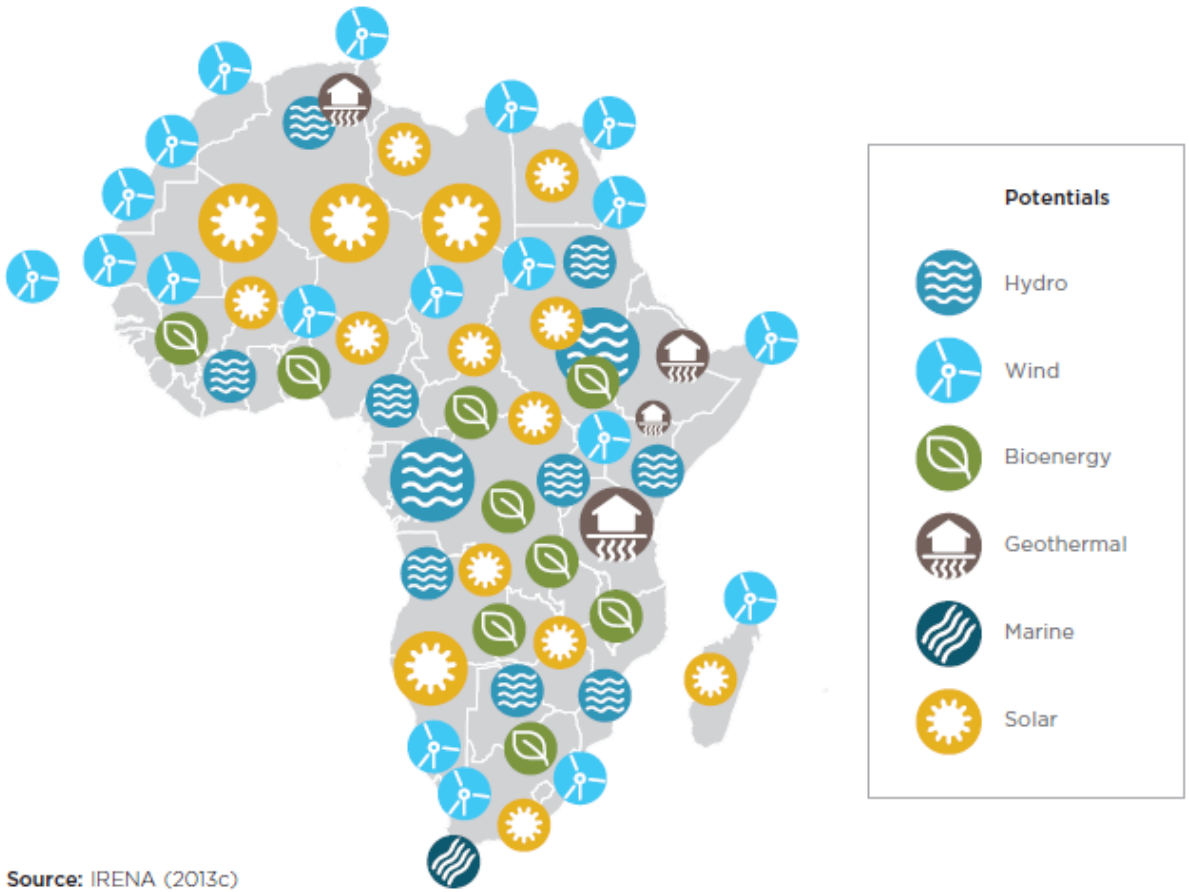
	Wind power	Hydropower	PV	CSP	Geothermal	Bioenergy
Algeria	1,881**		5,064**	766**	6**	375**
Egypt	7,200		220	1,100		
Äthiopien	770	9,481**			379**	
Kenia	635*		423*		2,250**	
Morocco	2,000	2,000	2,000			
Rwanda		382*			310*	300*
South Africa	2,700		2,700			
Tunisia	797**		566**	188**		113**
Uganda		1,285*			45*	
Libya	600		344**			
Nigeria	23**	1,114**	273**			
Sudan	240**		235**	18**		
Total	**16,846**	**14,262**	**11,825**	**2,071**	**2,990**	**788**

* The target must be fulfilled before the year 2020. There is no specific target for the year 2020 or beyond.
** The target refers to a year after 2020 (e.g. 2030). We assume a constant increase in renewable capacity till 2020.

Source: Based on REN 21 (2015), DoE, South Africa (2013)

Distribution of RE potential in Africa

FIGURE 6: DISTRIBUTION OF IDENTIFIED RENEWABLE ENERGY POTENTIAL IN AFRICA

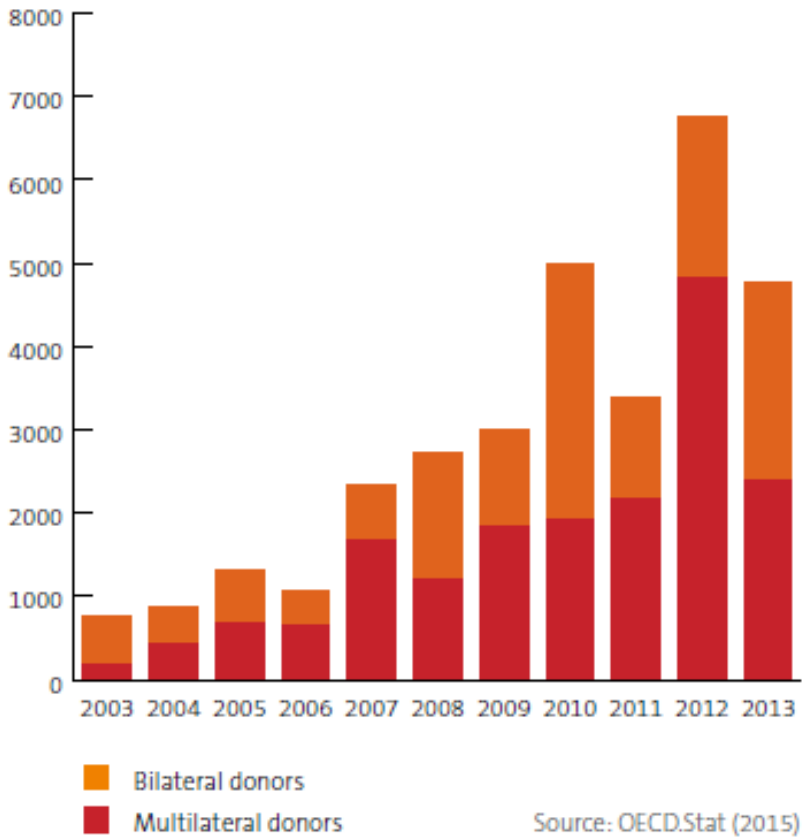


Source: IRENA (2013c)

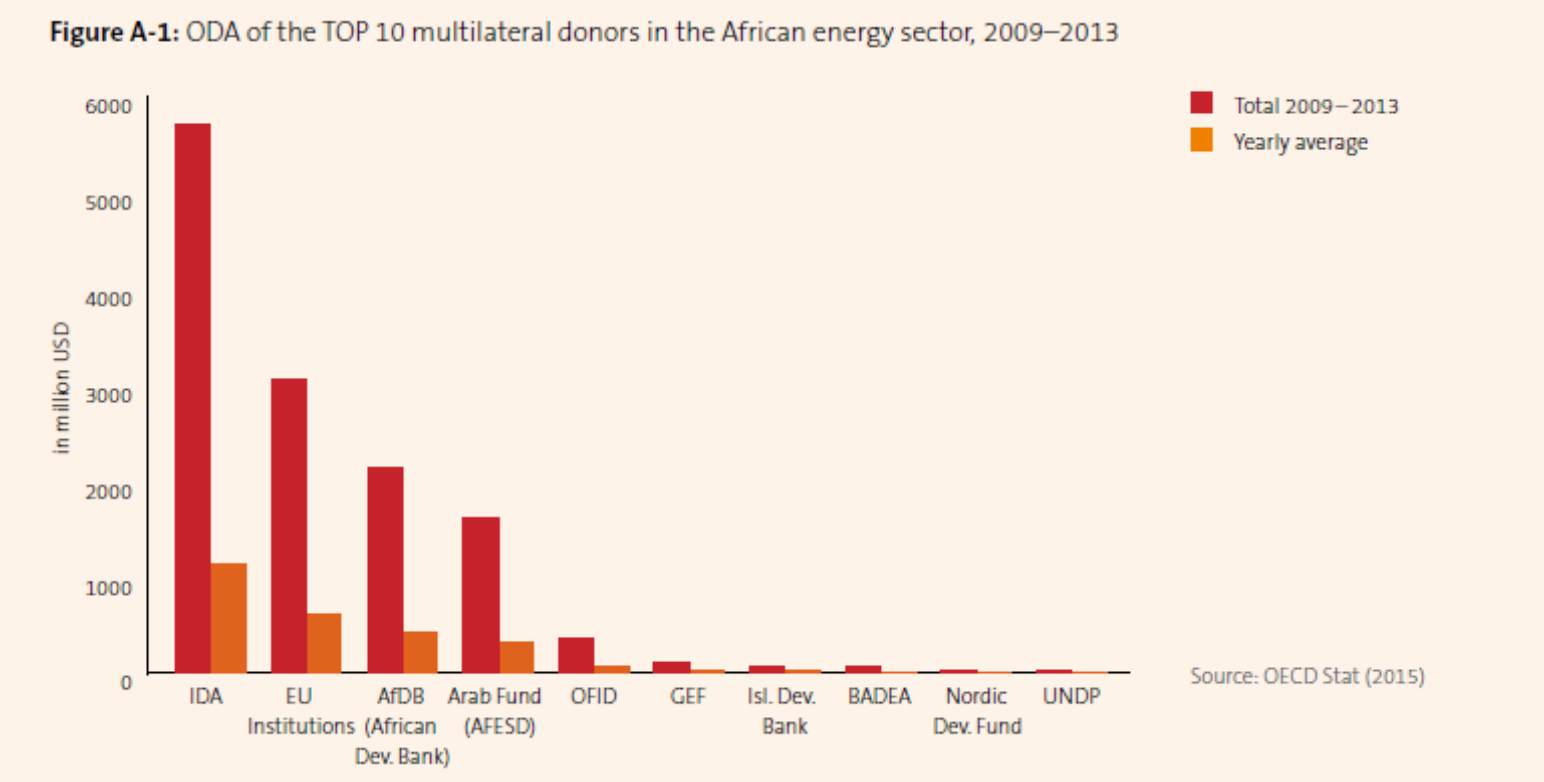
2) International cooperation to promote renewables in Africa

Energy ODA to Africa has increased significantly in the past years. RE is part of all major donors‘ portfolio.

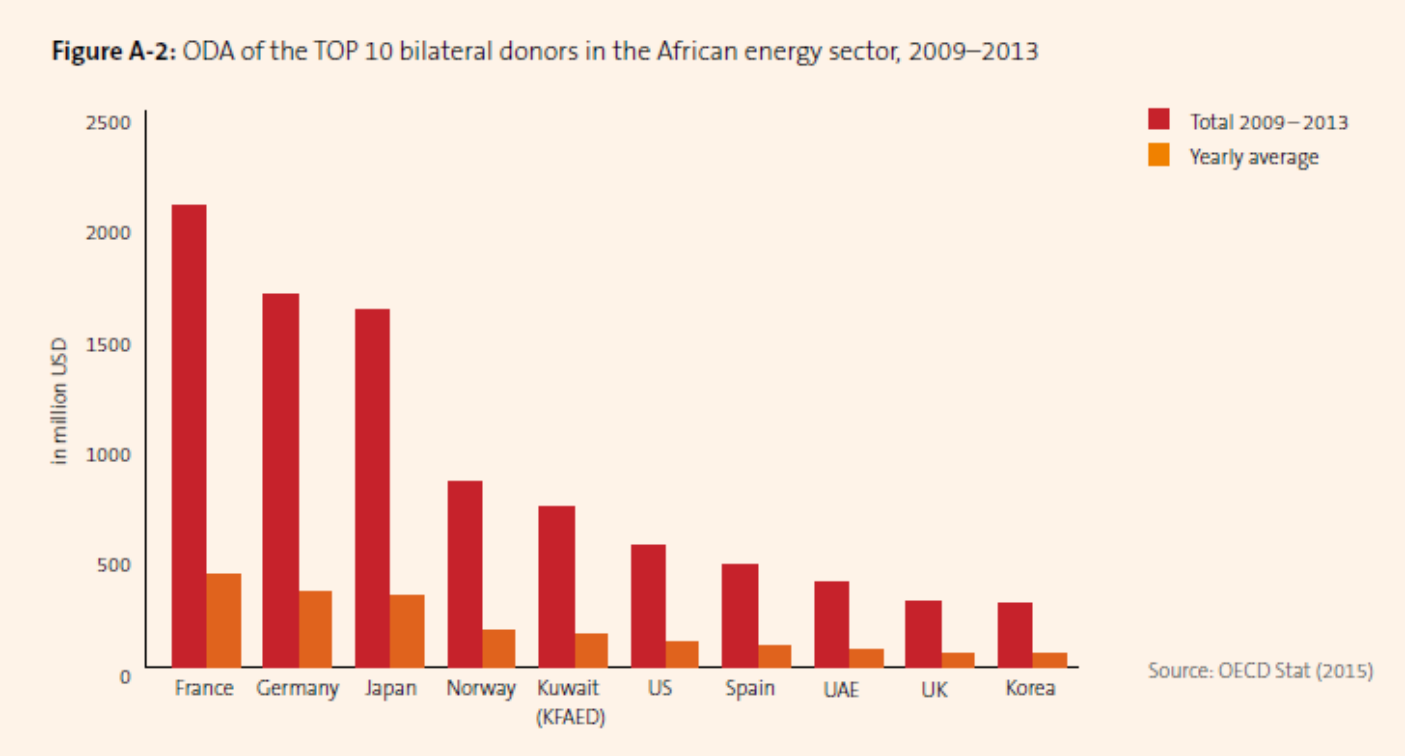
Figure 1: Development of energy ODA to Africa, 2003–2013



The World Bank, EU institutions, AfDB and the Arab Fund are major multilateral donors in the African energy sector.

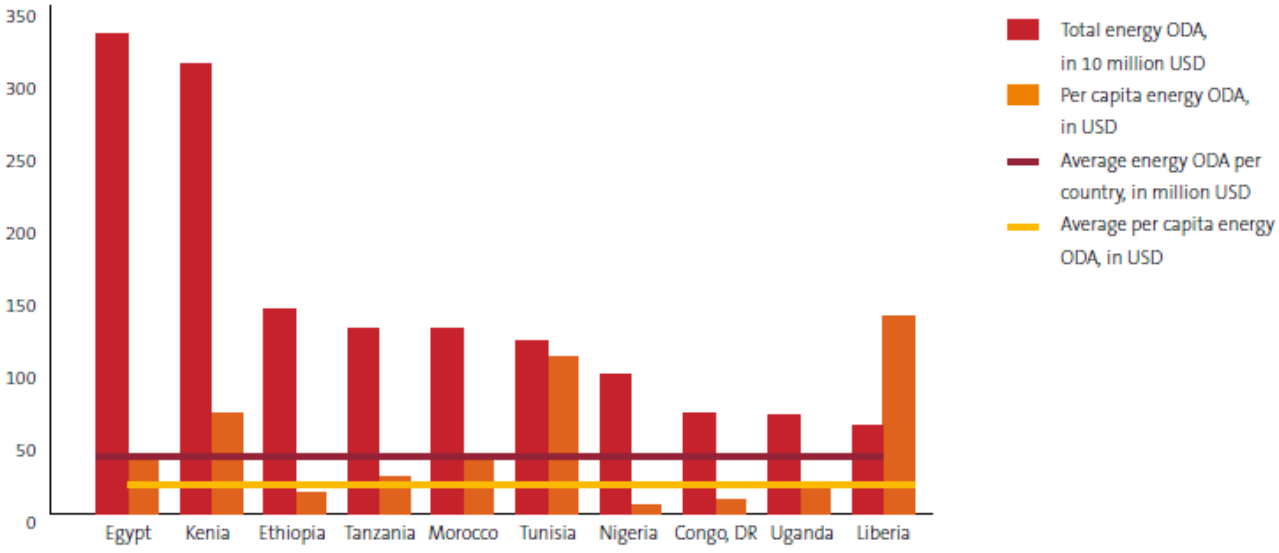


France, Germany and Japan are major bilateral donors.



Energy sector ODA on the African continent in unevenly distributed (I).

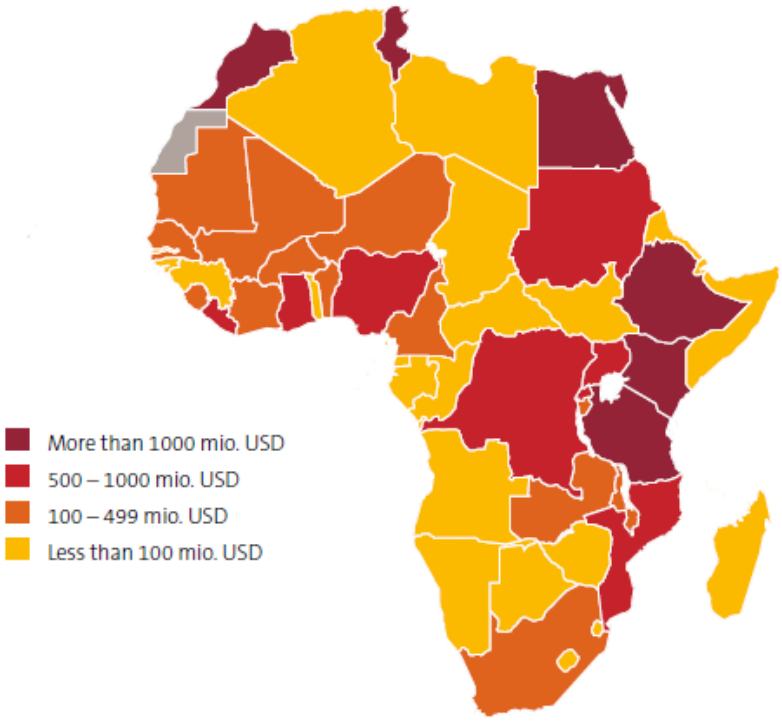
Figure 3: Top ten receiving countries of energy ODA in Africa on a country and per capita basis, 2009–2013, all donors



Source: OECD Stat (2015)

Energy sector ODA on the African continent in unevenly distributed (II).

Figure 5: Map 2: Geographic distribution of energy sector ODA



Options for further engagement

- Further engagement should build on existing initiatives, both nationally and internationally.
- Rapid scale-up: focus on frontrunners & rehabilitation of existing hydro facilities
- Support for off-grid solutions: does not lead to big numbers, put is important for promoting access to energy, local value creation & innovation

3) Financing renewables: the challenge of derisking

On the importance of derisking

- High investor risks constrain the development of the Africa energy sector as a whole
  - Weak financial strength of utilities
  - Weak grid infrastructure
  - Unstable policy framework

- Changes in risk perception have a strong impact on the competitiveness of RE investments
  - RE have relative high upfront investment costs but very low running costs
  - Running costs are driven by capital costs

- Reducing investment risk ("derisking") is key to attracting private sector investments in the energy sector and for upscaling RE

How does derisking work?

- Policy derisking: removes the underlying barrier/ root cause of investment risks
  - Policy design
  - Institutional capacity
  - Grid connection
- Financial derisking: transfers risk away from the investor
  - Loan guarantees
  - Risk insurances
  - Public loans
- Cornerstone of derisking: power purchase agreement
  - Provide RE suppliers with a fixed long-term price for power and guarantee access to the electricity grid (auctions or feed-in tariffs)
  - Policy derisking: offering guaranteed market access over a determined period of time
  - Financial derisking: offering a predetermined price over a selected time period

Options for derisking RE investments

- Comprehensive, country-level derisking initiatives
  - Without these, investments will remain heavily concentrated in countries with relatively high existing RE capacities
  - Positive example that should be expanded: GET Fit Uganda (combines feed in premium, partial risk guarantees and capacity building)
- Funding for early stage project development could close an important investment bottleneck
- Donor provision of risk guarantees
- Channel donor funds through local banks while developing capacities
  - local banks often lack technical expertise, international investors lack knowledge on local context
  - Engaging local banks is key for unlocking domestic finance

Thank you for your attention!

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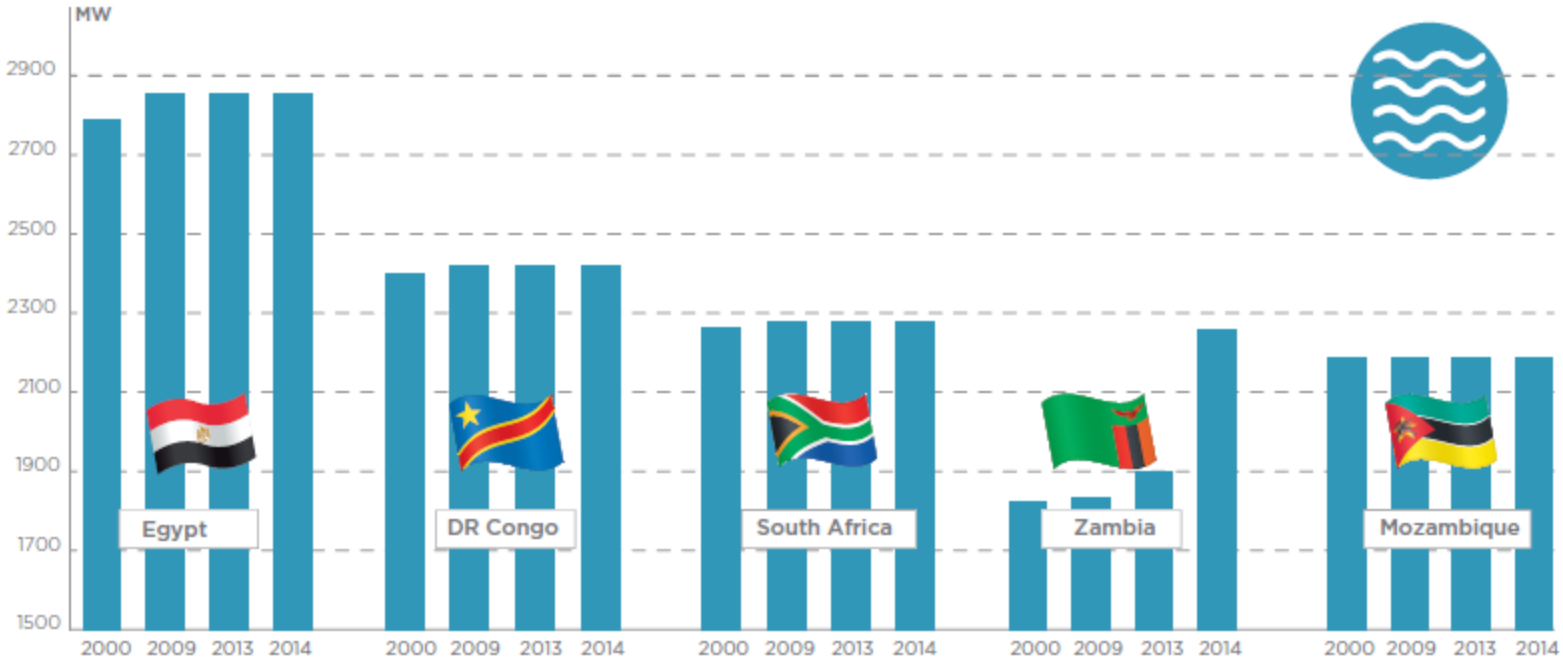
The Future of Africa's Energy Supply: http://www.iass-potsdam.de/sites/default/files/files/study_march_2016_the_future_of_africas_energy_supply.pdf

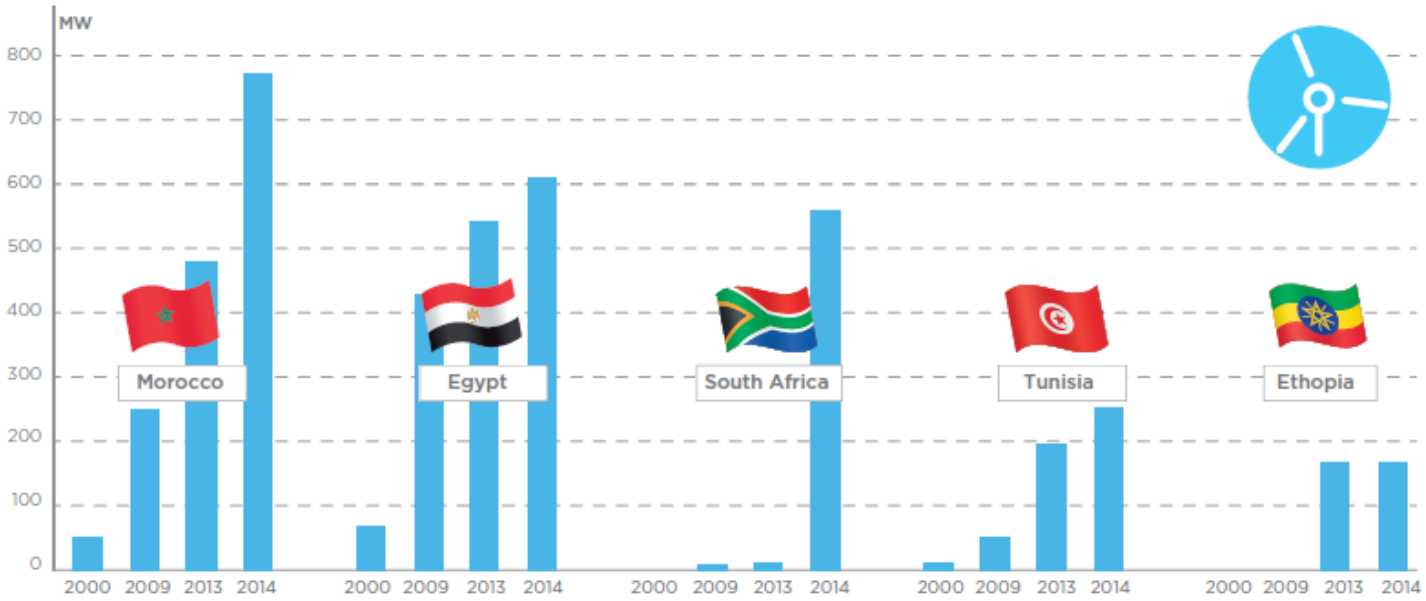
Mapping of Energy Initiatives and Programs in Africa: http://www.euei-pdf.org/sites/default/files/field_publication_file/mapping_of_initiatives_final_report_may_2016.pdf

FIGURE A-6: TOP FIVE COUNTRIES – HYDRO CAPACITY



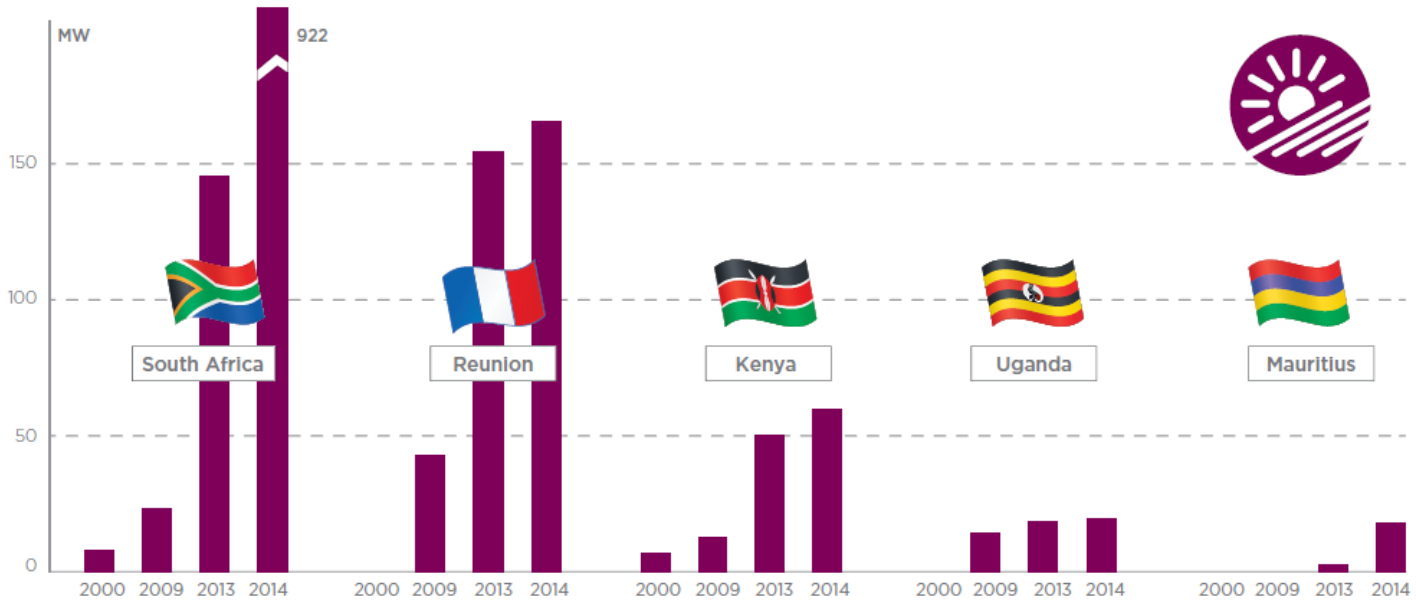
Source: Author's own graph based on IRENA Renewable Energy Capacity Statistics 2015

FIGURE A-7: TOP FIVE COUNTRIES – WIND CAPACITY



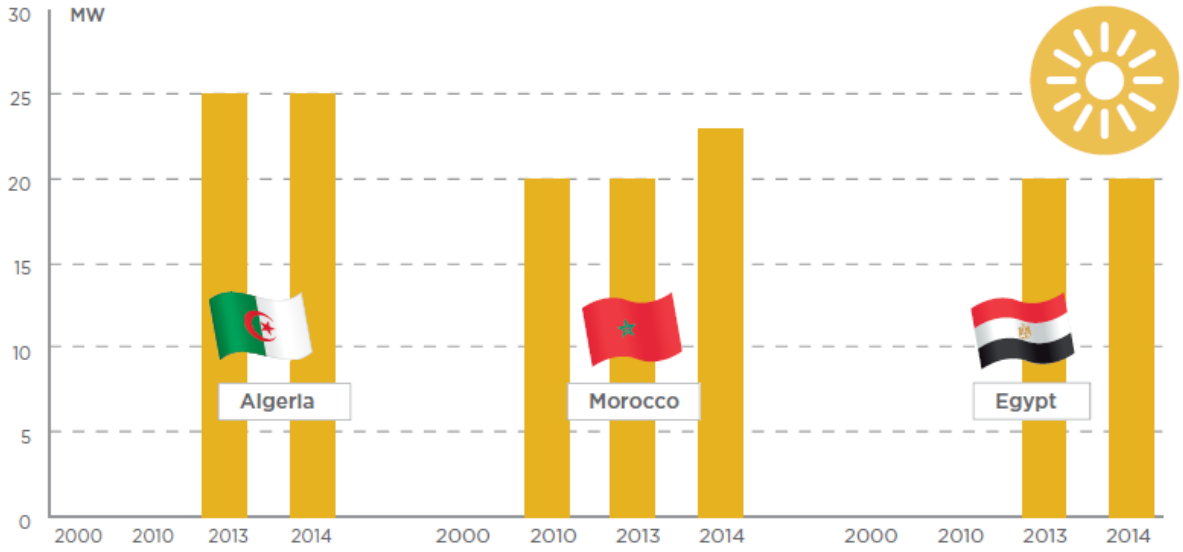
Source: Author's own graph based on IRENA Renewable Energy Capacity Statistics 2015

FIGURE A-8: TOP FIVE COUNTRIES – SOLAR PV CAPACITY



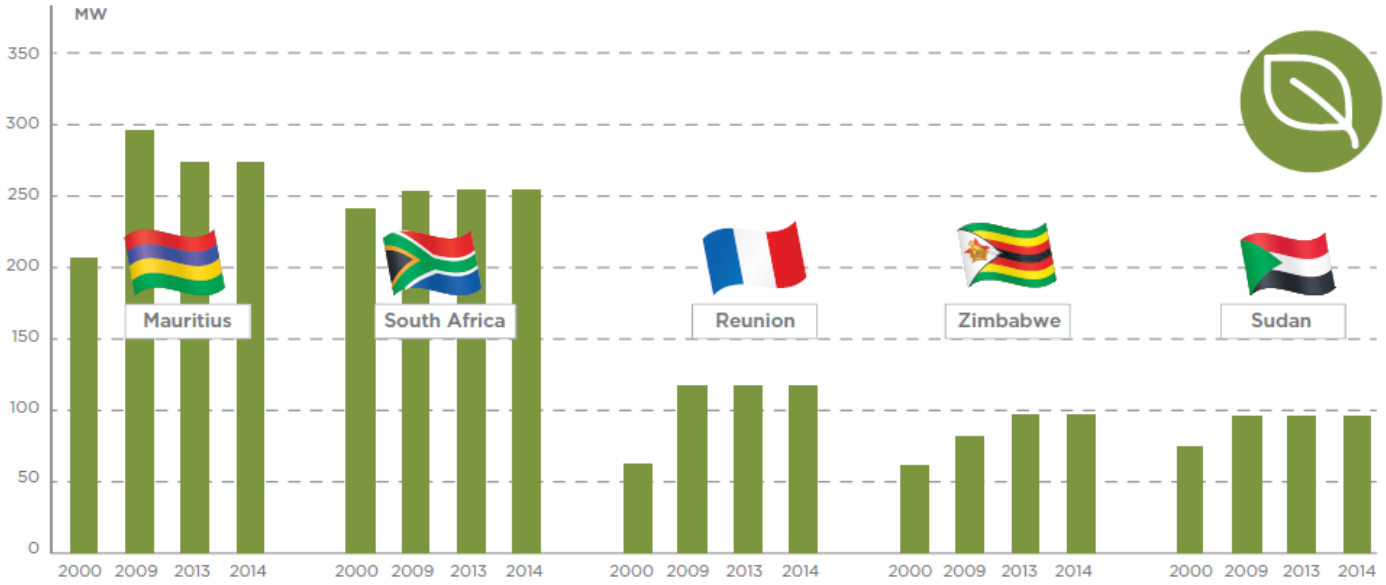
Source: Author's own graph based on IRENA Renewable Energy Capacity Statistics 2015

FIGURE A-9: TOP THREE COUNTRIES – CSP CAPACITY



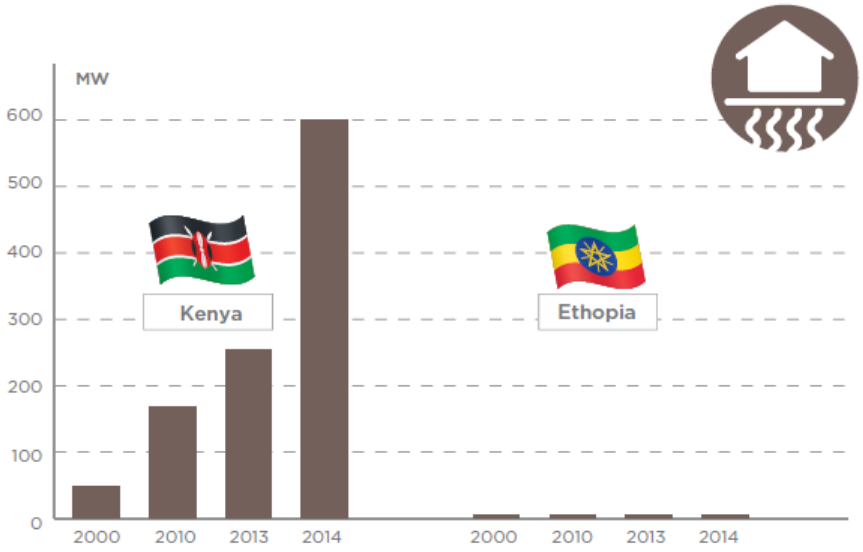
Source: Author's own graph based on IRENA Renewable Energy Capacity Statistics 2015

FIGURE A-10: TOP FIVE COUNTRIES – MODERN BIOENERGY CAPACITY



Source: Author's own graph based on IRENA Renewable Energy Capacity Statistics 2015

FIGURE A-11: TOP TWO COUNTRIES – GEOTHERMAL CAPACITY



Source: Author's own graph based IRENA Renewable Energy Capacity Statistics 2015

TABLE A-12: SCENARIOS FOR RENEWABLE ENERGY IN AFRICA BY 2020 (in GW)

	IRENA	AEEP	AEEP	IEA	IEA
	Current	25% scenario	50% scenario	New Policies	Century Case
Year	2014	2020	2020	2020	2020
Hydro	29	34	40	41	43
Biomass	1	-	-	2	2
PV	1	1*	2*	7	7
CSP	0	-	-	-	-
Ocean	0	-	-	-	-
Wind	2	2	3	-	-
Geothermal	1	-	-	-	-
Not specified	-	2	3	9	9
Total renewable energy capacity	**34**	**39**	**48**	**59**	**61**
Additional renewable energy capacity		**5**	**14**	**25**	**27**

* The AEEP report provides an aggregate value for PV and CSP capacity
Source: Author's own graph based IRENA (2015b), AEEP (2014), IEA (2014), GWEC et al. (2014)